APPLICATION BRIEFS

Ceemac: A Language for Teachers, Artists, and Animators

Gregory MacNicol
Computer Graphics Artist

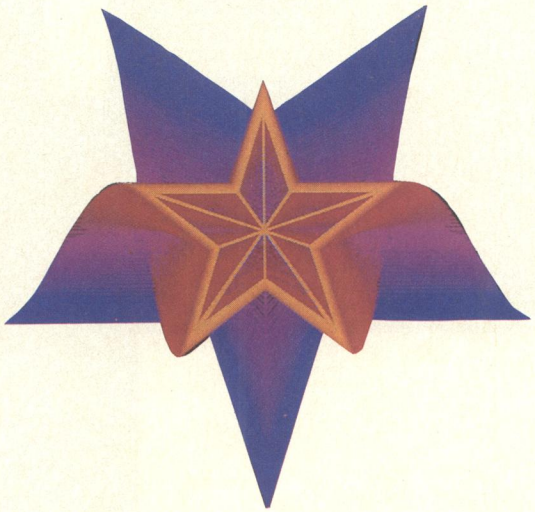

Figure 1. Designs in animation.

Ceemac is a graphics language designed to produce animated images quickly and easily. Originally designed for the Apple II, Ceemac includes a rapid prototyping editor, it interfaces to a tablet or joystick, it has a music interface, and it achieves very fast execution of graphics.

Man meets language

I first heard about Ceemac while teaching computer graphics at Santa Cruz High School and Harbor High. The demo program, called Fire Organ, is still one of the fastest graphics programs on the Apple. I tried the language and found it easy to produce images rapidly.

Better yet, I found the editor is very forgiving and is virtually crash-proof. The editor and language require few keystrokes. It becomes so easy to work with, so quickly that it feels as though you were making moves on intuition alone. These qualities are essential for teaching computer graphics.

Teachers' dream

Ceemac in the classroom setting achieved remarkable results. Out of 15 young people typically enrolled, 30 tended to show up. They'd get so engrossed, they didn't hear bells anouncing class changes. School would end and many didn't even know it. One of us would wake up at, say 5 p.m., and realize the whole afternoon had gone by while we were lost deep in the fun of working with Ceemac.

Of course it is a useful language for college teachers as well. It is a first-rate place to get started in computer graphics. I dare say some of those youngsters will find themselves in years to come grappling with a lot of the higher math that is the mainstay of computer graphics. And some of them may well be the very young people who once could see no reason for working at algebra, because "it doesn't apply to anything."

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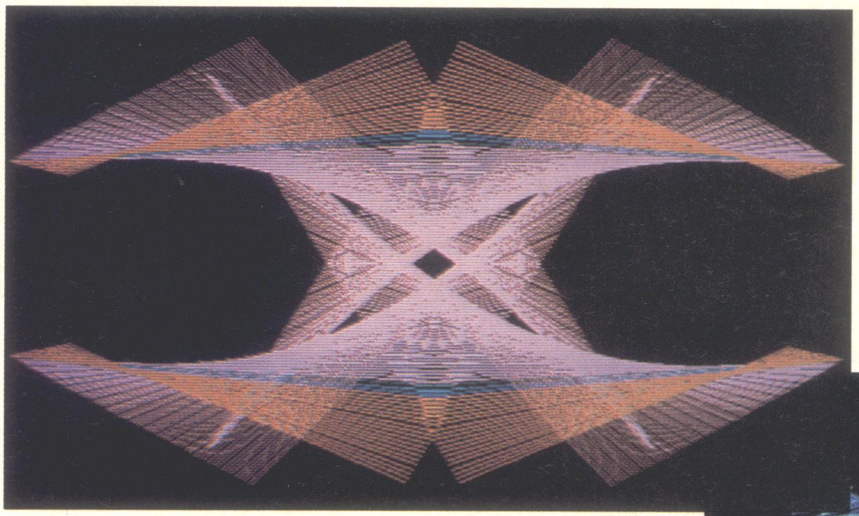

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Figure 2.

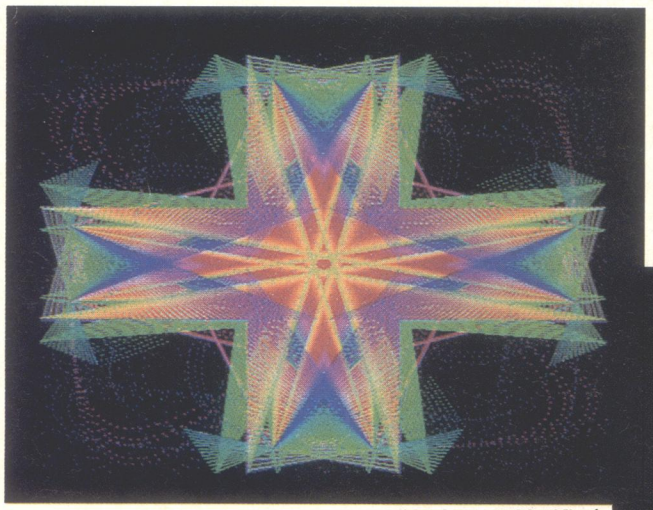

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Figure 3.

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Figure 4.

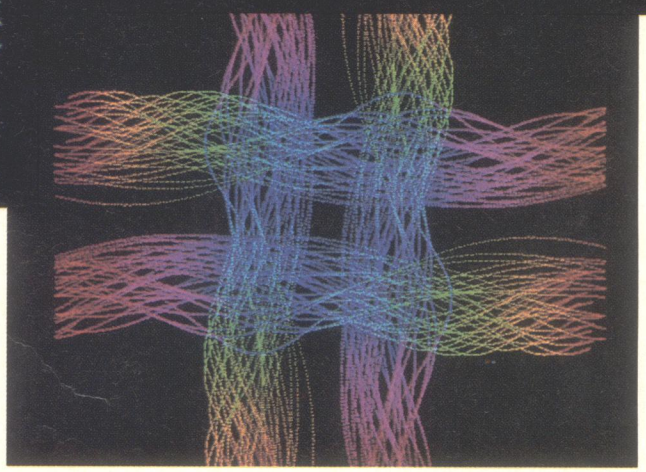

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Figure 5.

Finding the author

I was so impressed with the language, I made it a point to meet the author, Brooke Boering, at a SIGGRAPH conference. He told me he had originally planned the language to interface with music. In fact, he calls Ceemac programs *scores.*

Boering had been frustrated with conventional languages and graphics products. He wanted a graphics language for users, not for experts. He wanted something that was enjoyable to use.

Using Ceemac

As a computer graphics artist, I find Ceemac a joy to use. Naturally, I wanted more colors and resolution than the Apple II could give me. But I was also using a Vectrix VX384 frame buffer for much of my work. (The VX384 has a resolution of 480 × 672 pixels. The palette is 512 colors on screen out of 16.8 million available.) So I asked Boering if he would consider porting Ceemac over to the Vectrix, using the Apple as a controller.

I showed Boering the potential of high resolution with hundreds of colors. He found that an exciting proposition, so he and his associate, J.P. McMillan, put Ceemac on the Vectrix in a week.

One of our concerns was that the system would be slow. But both the Apple version and the Vectrix are conveniently fast. What's more, programs already written for the Apple run on the Vectrix.

Fast

I find the most delightful aspect of Ceemac is that you can see the animations immediately after writing the program. Even complex design changes can be made rapidly be-

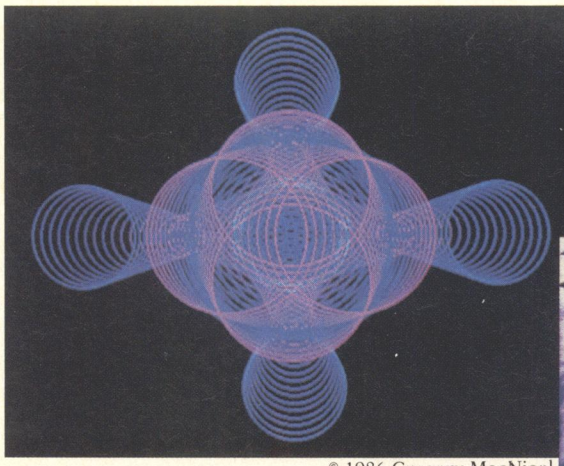

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Figure 6.

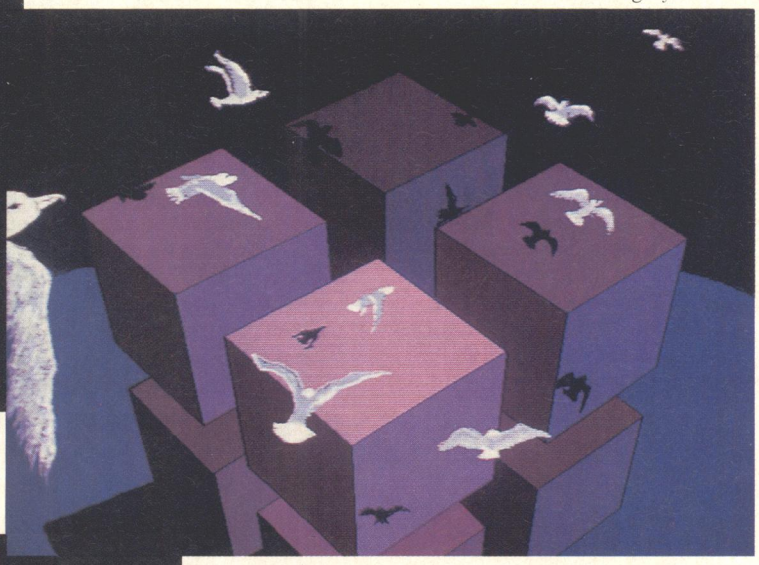

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Figure 8.

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Figure 7.

cause compile-time is about one second. Manipulation of the look-up tables is designed for real-time fades and rapid color shifts, which can be very dramatic. Color tables can be changed "on the fly." The fast execution speed also allows direct videotaping of the programs. I initially made animated videos in real time. Now I record images frame-by-frame for greater control of timing.

The language also gives me an easy interface to a film recorder.

Expanding

Ceemac is currently running on the Commodore C64, and on the IBM PC or compatibles as well. The AT&T VDA graphics board is presently used as the display device. Because of the high speed and greater memory of the IBM PC, many other graphics boards are being considered.

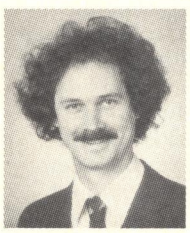
The pictures here

The pictures you see on these pages were done on an Apple II connected to a Vectrix VX384 graphics processor, using the Ceemac language. All the images are single frames from animated pieces, executed in real time. Figures 1 through 7 show images from animated design structures. There are 16 types of symmetry available in Ceemac. For these images I used two color palettes of 256 colors each at a resolution of $480 \times 672 \times 9$ bitplanes. Figure 8 is an image of birds in flight over cubes from an animated strip. The photographs were taken with a Dunn Instruments Microcolor.

Animation

While Ceemac may be considered a teaching tool or an artists' language, it is useful in commercial animation as well. Shapes and fonts are easily manipulated for a variety of animated works. For creative purposes, random variables can be placed in several parts of the program. The result is that you can produce many variations continuously; more than expected.

Right now the only way to get Ceemac is to contact Brooke Boering at 135 Stephen Road, Aptos, CA 95003. I have written more than 200 programs myself with this language, and I often share them with fellow teachers and others.



Gregory MacNicol is a computer graphics consultant, writer, and researcher. Previously he taught computer graphics in high schools and at the University of California, Santa Cruz. He is currently writing a book on affordable computer animation and is involved in computer graphics animation as a filmmaker, judge for contests, workshops teacher, and consultant for computer-generated special effects. His education was at MIT and New Mexico Tech in theoretical physics. His strong interest in art drives him to combine both the technical and artistic.

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